Rhodora

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THE NEW ENGLAND BOTANICAL CLUB

Vol. 11. September, 1909. No. 129

PARACEDROXYLON, A NEW TYPE OF ARAUCARIAN WOOD.[1]

EDMUND W. SINNOTT.

(Plates 80 and 81.)

PROF. J. B. WOODWORTH, of Harvard University, collected in 1906 some specimens of lignite from the clays of Second Cliff, Scituate, Massachusetts. This material was recently turned over to the writer for investigation. It consisted of several good-sized pieces, the largest of which was about 8 cm. long, 3 cm. wide and 3 cm. thick. There were also a number of smaller bits. This fossil wood was treated with 95% alcohol in a paraffin bath over night, and then left for 24 hours in a 4% solution of caustic potash in 95% alcohol. The solution was afterwards neutralized with weak hydrochloric acid. The lignite was now softened by a three days' stay in 20% hydrofluoric acid, in wax bottles. All traces of this acid were removed by leaving the material for a day under a tap of running water. The wood was now carefully dehydrated and embedded in celloidin in the usual way, after which microtome sections of it were cut.

The lignite exhibits an excellent state of preservation. Though it has been distorted somewhat by pressure, the details of its anatomy, such as the tori of the bordered pits, are still to be made out very clearly.

In the transverse section (Fig. 1), the wood is seen to be composed entirely of tracheids, traversed by thin-walled resinous medullary rays. The annual rings, in what is apparently the normal condition, are broad and not well marked, only the last few rows of cells of the

[1] Contributions from the Phanerogamic Laboratories of Harvard University, No. 18.

summer wood being noticeably smaller than the rest and having slightly thicker walls. The radial walls of the tracheids are well provided with bordered pits, and half-bordered pits occur between ray-cells and tracheids. Pits on the tangential walls appear in only the last two or three rows of the summer wood. Resin-canals and resin-parenchyma seem to be normally quite absent, though tracheids filled with resin or mucilage occur irregularly throughout the wood.

A longitudinal radial section shows the tracheids crossed by medullary rays, which vary in height from two to twelve or more cells. There are no marginal tracheids. The ray-cells have very thin walls, and are often filled with "resin," thus presenting a close resemblance to those of the modern *Araucarineae* (Fig. 2). The only pits observable are the half-bordered ones between the rays and adjacent tracheids, there being none on the horizontal and terminal walls of the ray-cells. There are from four to six lateral pits from a ray-cell to each tracheid with which it comes into contact. These pits are circular in outline, and each has an oblique, slit-like mouth. The radial pits between tracheids show clearly in this section (Fig. 4). They are rather large and have elliptical openings, which are set obliquely, those on opposite sides of the same pit thus appearing to cross one another. No cases were observed in which a tracheid had more than one row of pits. In a few places the pits are flattened somewhat by mutual contact, but in the great majority of instances they are circular in outline, though often occurring close together in long rows. A careful search was made for bars of SANIO between the pits, but in no instance were these discovered. Trabeculae were found in a few cases (Fig. 5), as were also septate tracheids. No wood-parenchyma, however, was observable, though as above remarked resin-filled tracheids occur irregularly (Fig. 6). The tangential pits on the face of the summer wood show clearly in this section.

The longitudinal tangential section shows the rays to be composed of cells with oblong cross-section, resembling those of most of the modern Conifers (Fig. 3). The very thin walls of the ray-cells are evident. Where the section passes through an annual ring, the tangential pits appear in face view. They are smaller than those on the radial walls, and sometimes occur in more than one row to a tracheid. In such cases, however, there seems to be no regular arrangement of the pits.

The structure of the normal wood is therefore very simple. A num-

ber of pieces which were examined, however, appear to have been taken from the vicinity of one or more healed wounds. In such cases, the annual rings are much narrower than normally, and rows of very thick-walled, flattened cells occur on the face of the summer wood. Here and there throughout the wounded area are distorted clusters of thin-walled cells, in rows at right angles to the rays. The structure of these cells is hard to make out, either in transverse or in longitudinal sections. They are probably parenchyma, though possibly very much modified tracheids. These groups of cells strongly suggest the clusters of parenchyma representing abortive resin-canals in certain of the *Abietineae*, notably *Tsuga*. They may possibly be open to the same interpretation.

At two places observed, there was a band of wound-tissue at the annual ring (Fig. 7). In the transverse section, this is seen to begin as a narrow strip of cells which increases in width toward the apparent position of the wound, though no piece showing the actual wound was found. The tissue is composed of very thick-walled, much-pitted parenchyma. Where the band is wide, large mucilage-filled spaces appear in it, surrounded by the parenchyma. These cavities are sometimes nearly circular in cross-section, but are more often somewhat flattened laterally. In the intervals between them, the rays cross the wound-tissue (Fig. 8).

A longitudinal radial section exhibits these mucilage-filled spaces interrupted here and there by the passage of rays across them (Fig. 9). In this region, the horizontal and often the end walls of the ray-cells are much thickened and pitted, in strong contrast to their normal condition (Fig. 10). The mucilaginous contents of the spaces is often vacuolated, and contains here and there masses of material much darker than most of it. The wound-tissue is usually bounded, next the normal wood, by rows of septate tracheids (Fig. 11).

A longitudinal tangential section through the wide part of the band of traumatic tissue, where these cavities appear, shows that they form a net-work of mucilage-spaces, separated only by the rays or groups of rays which cross them (Fig. 12). In the narrower part of the strip of wound-tissue, the cavities grow much smaller, cease to be connected, and finally disappear.

The resemblance between these cavities and traumatic resin-canals, especially when seen in cross-section, is close, and as wound structures are often abnormal and monstrous, it seems safe to infer that the

traumatic spaces in this lignite represent modified resin-canals. They appear to be intermediate between typical traumatic canals and the wound-tissue of the modern *Araucarineae*, in which canals are never formed.

One piece was observed which showed an apparent bit of wound-callus tissue, such as is formed in the wound cap of all the Conifers.

We may now discuss the probable affinities of this interesting fossil. Its general anatomy places it unquestionably among the Conifers. One of the earliest scientific classifications of the woods of this group, but one which, in its main aspects, is largely adopted by most anatomists of the present day, was put forward by KRAUS (1). He divides coniferous woods into five main groups or "genera." The type *Araucarioxylon* comprises those forms in which the pits on the radial walls of the tracheids are closely adjacent and mutually flattened, and when occurring in more than one row, alternating with one another. The modern Araucarians represent this condition. All other coniferous woods, according to KRAUS, possess circular, unflattened pits which, when in two rows, are opposite one another. The group *Taxoxylon*, with *Taxus* for its type, he separates on its possession of spirally thickened tracheids throughout. The genus *Pityoxylon* includes all those forms in which resin-canals are present. The remaining Conifers, which are considerably more simple in their structure, are comprised under two groups — *Cedroxylon*, represented by such forms as *Abies*, *Cedrus* and *Tsuga*, in which resin-parenchyma is absent or nearly so; and *Cupressoxylon* (or *Cupressinoxylon*) in which occur the numerous forms of the *Cupressineae* and *Taxodineae*, where resin-parenchyma is abundant.

According to the classification of KRAUS, our fossil would clearly come under the head of *Cedroxylon*, for its pits are neither alternate nor noticeably flattened, its tracheids are not thickened spirally, and it possesses neither resin-canals nor resin-parenchyma in the normal wood.

This classification, however, has recently been altered to some extent by GOTHAN (2). Among other objections to the system of KRAUS he remarks that as resin-parenchyma has been found rather abundantly in several of the forms commonly included under *Cedroxylon*, such as certain species of *Abies*, it does not form a good criterion for separating this type from *Cupressinoxylon*. He observes, however, that the character of the wall of the ray-cell is quite distinctive

in the two groups. In *Cedroxylon*, the horizontal and end-walls are frequently perforated by simple pits. In *Cupressinoxylon*, these pits are absent or poorly developed, and the walls of the ray-cell are consequently smooth. The criterion of the presence of wood-parenchyma can be used, according to GOTHAN, only with caution and in connection with this more distinctive character of separation. GOTHAN would certainly include our lignite under *Cupressinoxylon*, for the horizontal and end walls of the ray-cells are entirely smooth and free from pits.

Until a few years ago, the *Araucarineae* were supposed to be an isolated family, with wood-structure clearly distinct from that of the rest of the Conifers. Only recently have forms connecting the *Araucarineae* with the other Conifers been observed. In 1906, HOLLICK and JEFFREY (3), on investigating the anatomy of the Cretaceous genus *Brachyphyllum*, found it to be an undoubted Araucarian, as shown by its flattened pits and thin-walled rays, but differing from the modern members of the family in the absence of wood-parenchyma, the scarcity of alternate pitting, and the presence near wounded regions of traumatic resin-canals. In a recent memoir by these investigators (4), the name *Brachyoxylon* is given to this type of wood. It is characteristic of a number of genera, not hitherto believed to have been connected with the *Araucarineae*, which have been described by them from the Cretaceous deposits of Staten Island, New York.

In 1907, JEFFREY (5) described an interesting new fossil genus, *Araucariopitys*, which, while clearly an Araucarian conifer, approaches much more closely than does *Brachyoxylon* the structure of the *Abietineae*. It possessed deciduous shoots, thick-walled, much-pitted ray-cells, and abundant traumatic resin-canals.

In 1907, also, GOTHAN (6) described a new species of *Cedroxylon*, *C. transiens*, in which the alternating and flattened pits of the Araucarians are very often present. Wood-parenchyma occurs at the end of the year's growth, the ray-cells are thick-walled and pitted, and one "anomalous" resin-canal was observed. GOTHAN also refers to *Larix Johnseni* of SCHRÖTER, which possessed alternating pitting but numerous resin-canals.

It is instructive to look at our fossil in the light of these recent observations. As above remarked, it would ordinarily be classed as a *Cedroxylon* or a *Cupressinoxylon*. We have already noticed, however, the thin-walled and Araucarian-like structure of the rays. Such extreme thinness and smoothness of wall is very rare, if not quite ab-

sent, in any other group of Conifers except *Pinus*. The pitting, however, is not of the characteristic Araucarian type, and the traumatic resin-canals strongly suggest the *Abietineae*.

Another character, however, not striking but apparently very important, seems to place our wood unquestionably among the *Araucarineae*. Miss GERRY (7), working in this laboratory, has investigated the occurrence in the Conifers of bars of SANIO between the radial pits of the tracheid wall. She has completely failed to find these in either of the living genera *Araucaria* or *Agathis*, or in the fossil Araucarians such as *Araucarioxylon*, *Araucariopitys* and a number of forms with the *Brachyoxylon* type of wood. In *all* other living genera of the Conifers, however, and in a number of closely related fossils, including the recently described *Prepinus*, bars of SANIO were discovered. In the fossil wood here under investigation, as above noticed, they are entirely absent.

This lignite, therefore, appears to be another addition to that interesting group of Conifers on the border-line between the *Araucarineae* and the *Abietineae*, the occurrence of which seems to warrant us in believing that the families are related, and that one has probably given rise to the other. The prevalent view at present considers the *Araucarineae*, largely because of the resemblance of their pitting to that of the *Cordaites*, to be the most primitive Conifers, and the *Abietineae*, from their more complicated structure, to be the most recent members of the group. JEFFREY, however, on the testimony presented by the very primitive *Prepinus*, and on the general principle that wounds bring about reversions to more ancient structures, as well as on other evidence, believes the *Abietineae* to be the oldest Conifers. The traumatic canals of *Araucariopitys* and of the *Brachyoxylon* type, undoubted Araucarians, are explained as relics of a structure normally present in their Abietineous ancestors. Perhaps the thickened and pitted ray-cells in the traumatic tissue of the lignite here under consideration may be a reversion to the typical ray of the *Abietineae*.

Accepting the correctness of JEFFREY'S views, the phylogenetic position of our lignite seems reasonably clear. Its structure approaches that of *Brachyoxylon* more closely than it does that of anything else. In its resin-canals, it shows less resemblance to the *Abietineae* than does this fossil, though in its pitting it approaches the *Abietineae* much more closely. Perhaps the most logical explanation of its position is to consider it a member of an extinct group of the *Araucarineae* which

separated from the ancient Abietineous stock, on the line of ascent toward the *Araucarineae*, before the appearance of flattened pitting; and in which the traumatic canals have been on the whole more reduced than in *Brachyoxylon*, having progressed still farther from the condition found in the *Abietineae*.

The occurrence at Second Cliff, Scituate, of a primitive Araucarian Conifer, such as the one under investigation, is interesting in the light it throws on the age of the geological formation at this place. None of the fossils nearest in structure to our lignite, such as the widely distributed *Brachyphyllum*, and numerous others whose wood structure has been shown to be of the *Brachyoxylon* type, have ever been found in deposits more recent than the Cretaceous. It seems quite probable, therefore, that the clays of Second Cliff, the age of which have been much in doubt, may also be referred to this period. This confirms the conclusions reached by JEFFREY and CHRYSLER (8) with regard to Third Cliff, Scituate.

As the structure of this fossil wood is markedly different from that of anything heretofore described, it has been thought best to include it under a new genus. From its superficial resemblance to the *Cedroxylon* type, as described by KRAUS, and from the place of its discovery, the name **Paracedroxylon scituatense** is proposed for it.

SUMMARY.

1. *Paracedroxylon scituatense* is the wood of an Araucarian Conifer from the clays of Second Cliff, Scituate, Massachusetts.

2. Its normal structure consists of tracheids and medullary rays. The cells of the latter are thin-walled and pitless, except next the adjacent tracheids. The annual rings are poorly marked, and on the face of the summer wood occur tangential pits. The radial pits on the tracheid walls are in almost every case circular in outline and not flattened by mutual contact. Bars of SANIO are entirely absent.

3. In wounded regions occur groups of thin-walled cells which possibly represent abortive resin-canals.

4. Bands of traumatic tissue may also appear near wounds. These consist of very thick-walled parenchyma, usually bounded next the normal wood by septate tracheids. Where they are widest, large anastomosing mucilage-spaces appear in them. These probably

represent somewhat modified traumatic resin-canals. As the rays cross the wounded area, their cells become thick-walled and pitted.

5. *Paracedroxylon* is another primitive Araucarian, on the border line between this group and their ancestors, the primitive *Abietineae*. It probably left the ascending Araucarian line before the appearance of flattened pitting. Its traumatic canals were subsequently much reduced from the typical Abietineous condition.

6. The presence of *Paracedroxylon* in the Second Cliff clays makes it probable that they are of Cretaceous origin.

I desire to express my sincere thanks to Prof. E. C. JEFFREY for advice during the course of the work.

This investigation was carried on in the Phanerogamic Laboratories of Harvard University.

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Explanation of Plates 80 and 81.

Fig. 1. Transverse section, showing the rather faintly marked annual ring. × 40.
Fig. 2. Radial section, showing structure of a typical ray. × 200.
Fig. 3. Tangential section. × 200.
Fig. 4. Radial section, showing character of bordered pits and absence of Bars of Sanio. × 500.
Fig. 5. Radial section, showing trabeculae. × 200.
Fig. 6. Radial section, showing mucilage-filled tracheids. × 120.
Fig. 7. Transverse section, showing a broad band of traumatic tissue. × 40.
Fig. 8. Transverse section, showing three of the traumatic canals, enlarged. × 120.
Fig. 9. Radial section, showing mucilage-spaces. × 40.
Fig. 10. Radial section through the traumatic tissue showing the much thickened and pitted walls of the ray-cells in this region. × 200.
Fig. 11. Tangential section through the margin of the traumatic tissue, showing septate tracheids, tangential pits, and thick-walled ray-cells. Note the beautiful preservation of the bordered pit. × 500.
Fig. 12. Tangential section through the wide part of the traumatic band, showing the anastomosing mucilage-cavities crossed by the thick-walled rays. × 40.

AN ACCOUNT OF CERTAIN NOTEWORTHY FEATURES IN THE HABITAT OF RHODORA.

D. P. Penhallow.

For the enthusiastic collector, a large amount of interest always centers in *Rhodora*, not only because it is one of the most brilliant and fascinating of our early flowers, but also because it is commonly associated with bogs, of which it is generally held to be typical. For these reasons, any deviation from its recognized habit at once attracts attention and calls for some explanation. During the present spring large areas of this species have come under notice, and in some instances the size of the shrub and its particular habitat have presented such strong deviations from what one is accustomed to, as to suggest the importance of placing the principal facts on record.

At Shelburne, New Hampshire, in the valley of the Androscoggin,

there is a characteristic bog of somewhat more than an acre in extent, known as Wheeler's Bog. The central portion is at present occupied by a perfectly clear water field, while the margin, which is extending rapidly toward the centre, and occupies about two-thirds the entire area, affords an exceedingly fine example of the *Cassandra* stage in bog development. Here and there, however, small islands have gained a slight elevation above the *Cassandra* growth and exhibit the commencement of the next stage, that of broad-leaved trees, in which the common birch is represented. All about the margin of the bog, and extending into the interior of the *Cassandra* growth, there is an abundance of *Rhodora* which attains to a height considerably above 6 dms. Owing to the inaccessible character of the bog, it was not possible to take actual measurements, but there was a very strong impression that some of the bushes must be at least 9, and possibly 12 dm. in height. The particular point I wish to emphasize is the fact that this location affords a striking illustration of the typical habitat of *Rhodora*, which is described in the manuals as inhabiting "Cool bogs." [1]

A few days later, on the occasion of a visit to St. Andrews, New Brunswick, an opportunity was afforded for the examination of certain localities there. St. Andrews is somewhat farther north than Shelburne and is in close proximity to salt water, but judging by the character of vegetation, there is reason to believe that there can be no great climatic difference between the two places and for our present purposes, they may be regarded as essentially the same.

Geologically speaking, Shelburne is to be regarded as representing a much older geological formation than St. Andrews. The surface deposits consist of drift material derived in the main from Laurentian gneisses, intrusive granites and other rocks extending into the early Palaeozoic as far as the Cambrian. To this must also be added the material derived from erosion of innumerable trap dykes which intersect the older rocks everywhere.

At St. Andrews, on the contrary, the surface structure has been derived chiefly from red sandstone, usually regarded as Devonian, with which there has been mixed to some extent, the detritus of granite and trap dykes. How far this difference in the character of the soil may be a factor, it is at present impossible to say, as no observations in that direction have been made.

[1] The latest revision of Gray's Manual specifies "swamps and moist slopes."

Within the limits of the St. Andrews peninsula, *Rhodora* is abundant and widespread, occurring under somewhat widely different conditions of exposure and moisture; and as a detailed discussion of these features is desirable, it will be most profitable to deal with each locality studied. These are:—

1. Indian Point.
2. The eastern slope back of O'Neill's slaughter house.
3. The Protestant Cemetery.
4. The eastern slope near the Algonquin hotel pumping house.

The lower end of the St. Andrews peninsula is known as Indian Point, and for our present purpose, may be regarded as embracing all that portion which lies to the south of the Canadian Pacific Railway. This area lies at a low level and is only slightly undulating. The rather thin soil rests directly upon red sandstone, and it is so slightly above high water mark that the margin suffers marked erosion under the action of winter storms and tides, to such an extent that special means are required for the protection of the road skirting the beach.

The drainage is, on the whole, good. Within the timbered area there is practically no bog land. At one or two points near the margin of the woods, soft spots are to be observed, but these dry out in early summer. Elsewhere, the floor of the forest is the same as that generally characteristic of moist woodlands, i. e. it is covered with moss, *Cornus canadensis* and the herbage usually found in such situations. Numerous roads are cut through the wooded area, and these show the best of drainage.

The open areas are occupied chiefly by grasses and sedges, with scattering growths of *Spiraea latifolia* and *Kalmia angustifolia*. Apart from a small sink hole and a shallow bog of about one acre in extent, occupied entirely by *Typha latifolia*, there is nothing within the entire area of Indian Point, which falls under the designation of bog-land.

At least three fourths of the entire area at Indian Point is occupied by a dense growth of wood. This is composed, for the greater part, of black spruce and fir, and white cedar. With these there is mingled a large amount of the common alder. The trees within this area are all small, probably not exceeding 6–8 m., but the growth is so dense as to make it very difficult for one to penetrate to the interior. The floor is level, and wherever an opening admits sunlight, it is at once occupied by *Diervilla Lonicera*, *Cornus canadensis* and other plants common to open woodlands.

Rhodora does not penetrate to the interior of the wood, but is confined to the margin from which it has spread into the open areas. At one place, the shrub occurs where there is a slight bogginess in spring, though it does not attain its best development. At this time — the first of June — the locality is quite dry. Following the margin of the copse specimens occur more frequently toward the drier ground, and are constantly found in association with *Cornus canadensis, Diervilla,* ferns and mosses. On the south side where there is an extended open area toward the beach the shrub has passed much beyond the trees into the open and dry ground, where it appears to be extending.

In the open area just described, the shrubs are rarely over 30–40 cm. in height. On the western side of the woods, it is more commonly 6–9 dm. high. Here, however, several shrubs were found to have a height of 12 dm., while on the southern, western and northern sides, they were considerably taller. Careful measurements showed a number at least 1.5 m. high, while in one instance 1.6 m. was the result obtained. A noteworthy feature connected with these variations, was observed in the fact that the plants were always smallest in the open, while on the edge of the wood, where sheltered by the trees, they invariably attained their greatest height and stoutest stems.

The second locality studied, lies on the eastern slope of a rather high, gravelly ridge near its southern extremity, back of O'Neill's slaughter house and just above the Canadian Pacific tracks. The soil is perfectly well drained, and shows no indication of a swampy condition at any season of the year. The area was, until very recently, occupied by the common alder. *Rhodora* shows an abundant growth over a tract about two by eight rods in extent, but scattering specimens are found over three or four acres. None of the shrubs are over 6 dm. in height, and they therefore conform to the dimensions usually assigned to the species. No other Ericaceous plants occur in the immediate vicinity.

The Protestant Cemetery lies on the summit of a high, gravelly ridge opposite Minister's Island. On the top of this ridge, and within the limits of the Cemetery, there is a slight depression occupied by a shallow bog which becomes dry in summer, and, even on the first of June, shows very little moisture. This basin is about one acre in extent. Throughout its entire area, there is a good growth of *Iris versicolor,* and indifferent specimens of *Spiraea latifolia. Osmunda cinnamomea* and *Onoclea sensibilis* are abundant about the margin.

Rhodora is sparingly developed through the central area, but about the margin it becomes abundant and thence extends in scattering groups, into the adjacent drier areas of the summit. None of the specimens are large, with little or no variation in size, and it may be said that they conform very well to the general description of one metre or less. As one leaves the Cemetery and ascends the opposite slope on the summit of which the Algonquin hotel is situated, a noteworthy growth of the shrub is encountered at the position of the pumping station. The specimens spread over an area of one or more acres. The soil in this locality is a loose sand and gravel affording perfect drainage. The vegetation consists of poorly developed grasses, mixed with mosses and an abundant growth of the mountain cranberry (*Vaccinium Vitis-idaea*, var. *minus*). On the very summit of this ridge, on a dry gravelly bank close to the roadside, there were two very fine and vigorous clumps of *Rhodora* about 6 dm. in height.

Passing in review, the facts noted, it is to be observed that no locality has yet been found in the neighborhood of St. Andrews where *Rhodora* appears to assume the typical bog habit. The only apparent exception appears in the occurrence of a single specimen on the edge of a bog near Joe's Point, on the road to the Biological Station; and in another specimen near the Canadian Pacific Station, which also grows on the edge of a small bog. On the other hand, it is of interest to note that the most frequent occurrence is in well drained areas, and this fact is consistent with the occurrence of the plant on the high edges of gravel banks in deep railway cuttings, as was frequently noted on the line of the Maine Central before reaching Vanceboro, Maine.

The distribution of this species in the bog at Shelburne, as well as its frequent occurrence under typical bog conditions through northern Maine, is ample justification for the character usually assigned to it. But, that it is not necessarily a bog plant; that it commonly occurs in areas which are not at all swampy, and that its unusual height is best displayed under the protection of small trees, are facts of interest and importance which deserve further study. As, at this writing, the foliage is but feebly developed, it is impossible to determine how the external morphological features are correlated with the environment, but it may be possible to ascertain some facts bearing upon this question at a later date.

McGill University.

A COLOR FORM OF CARUM CARVI.

Albert Hanford Moore.

In July, 1903, Prof. Arthur Stanley Pease and the writer made a short botanical excursion to northern Maine and Quebec. To those who have never been in this delightful region, it may be of interest to state that not merely the native flora, but also the introduced flora, differs very much from our own. Among the weeds common there which are not so abundant with us none are more conspicuous than *Vicia Cracca* L. and *Carum Carvi* L. The former lines the railroads with an almost solid strip of blue for long distances, while the other, which is only an occasional dooryard escape here, grows profusely in the fields and meadows and appears to take the place of our Queen Anne's Lace. The analogy to this plant seems even closer when we note that both show an occasional tendency to bear rose-tinted flowers. Dr. Millspaugh, in his Flora of West Virginia, 369 (1892), described *Daucus Carota* L. f. *rosea* Millsp. No name could be found for the rose-colored form of the Caraway, although a number of European and American floras refer to it. Lange, Haandb. Dansk Flora, ed. I, 174 (1851), describes *Carum Carvi* L. *β. atrorubens* as having purple corolla and leaf-sheaths. A figure of it in the Flora Danica shows purple flowers. I was at first uncertain whether this phase might not vary so little and so imperceptibly from the rose-colored form that the latter would not be worthy of separation. I am greatly indebted to Dr. C. H. Ostenfeld of Copenhagen for clearing my doubts on this matter. He states that the form with light rose flowers is much more common in Denmark than the other, enclosing, at the same time, some of the flowers of *Carum Carvi L.* var. *atrorubens* Lange, which prove its distinctness. He also very kindly informs me that he does not know of any name for the rose-colored form, the floras merely saying, "flowers white or rose," or only "white." It seems appropriate to supply this lack, so I subjoin the following name and diagnosis:

Carum Carvi L. f. **rhodochranthum** A. H. Moore, f. nov. floribus roseis. Type specimen: Quebec, Temiscouata County, St. Louis, July 9, 1903 (*A. H. Moore*, no. 1218, in Herb. Moore).

Cambridge, Massachusetts.

Meeting of the Josselyn Botanical Society.— The fifteenth annual meeting of the Josselyn Botanical Society of Maine was held at Peaks Island, Portland, Maine, from June 27th to July 2nd, 1909, with about twenty persons in attendance. Excursions were made to Old Orchard, Pine Point, Falmouth, Chebeag Island, and the Grand Trunk Railway yards in Portland, besides shorter trips to various parts of Peaks Island. Upon these trips many interesting species of plants were found, several being previously unknown from the region. On Tuesday evening Prof. M. L. Fernald of Cambridge addressed the Society upon the subject of "The New England Flora of the Future, or Changes in our Flora due to the Destruction of Forests," illustrating the address by specimens of the plants mentioned. On Thursday evening Prof. Fernald gave an informal talk upon some species of plants recently added to the state flora, showing specimens of the plants themselves.

The following list represents the more noteworthy species collected during the meeting. *Typha angustifolia* L., *Carex crinita* Lam., var. *gynandra* Schwein. & Torr., and var. *minor* Boott, C. *Michauxiana* Boeckl., *C. salina* Wahl., var. *cuspidata* Wahl., *Sisyrinchium gramineum* Curtis at Great Chebeag Island; *Panicum Werneri* Scribn., *Thalictrum polygamum* Muhl., var. *hebecarpum* Fernald, *Barbarea verna* Asch., *Potentilla recta* L. at Falmouth; *Carex muricata* L., *Rubus alleghaniensis* Porter, var. *calycosus* Fernald, *R. idaeus* L., *Hyoscyamus niger* L. at Peaks Island; *Oxalis stricta* L. at Pine Point; *Rumex mexicanus* Meisn., *Chenopodium leptophyllum* Nutt., *Amaranthus blitoides* Wats., *Coronopus didymus* L., *Neslia paniculata* Desv., *Tragopogon pratensis* L. at Portland.— Edward B. Chamberlain.

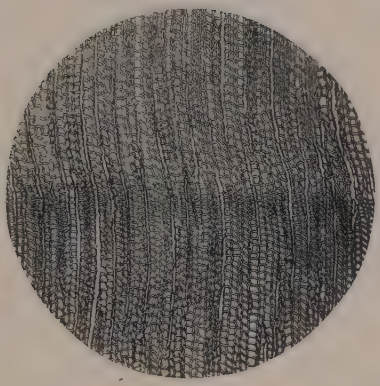
Habenaria dilatata, an omitted Record.— The following record should be added to the list of *Orchidaceae* published in Rhodora XI, 76:

Habenaria dilatata (Pursh) Gray. "A peaty meadow on left hand of road to South Reading [Wakefield], perhaps a mile from Stoneham depot" (*Wm. Boott*, no date. The specimen is in Gray Herb.); Reading and Stoneham (according to Dame & Collins, Fl. Middlesex Co., 106. 1888); Lexington (according to Baldwin, Orchids of N. E., 137. 1884).

In a letter to Mr. Walter Deane, dated April 17, 1909, Mr. Oakes Ames says of this species: "*H. dilatata* is extremely rare in Massachusetts, I have only seen specimens from Middlesex Co. (Hb. Gray) and from Franklin Co. (Sunderland, in Hb. Ames)."— Local Flora Committee.

Fimbristylis Frankii Steud., var. **brachyactis**, n. var., spiculis glomerulatis.— Spikelets glomerulate; otherwise as in the species.— In hard clay soil by the Stillwater River, Orono, Maine, August 18, 1908 (*M. L. Fernald*). Closely simulating the southern *F. Vahlii* (Lam.) Link, but with the 3-cleft style and the trigonous achene exactly of *F. Frankii* which, in its ordinary form abounds in the neighborhood where the variety occurs.— M. L. Fernald, Gray Herbarium.

Vol. 11, no. 128, including pages 149 to 164, was issued 9 August, 1909.



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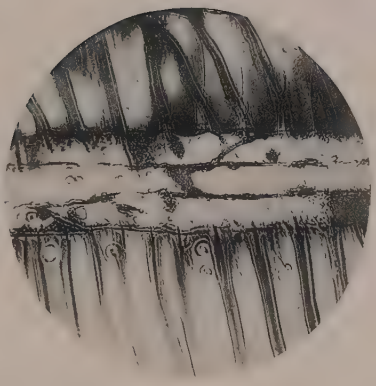

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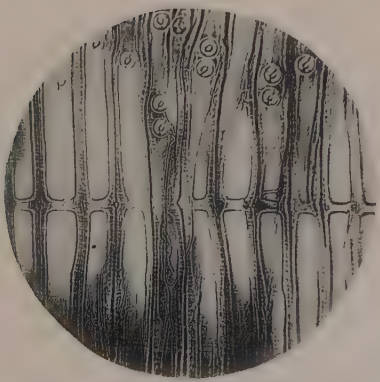

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